OBD BASIC SCREEN – DIAGNOSIS

Self-diagnosis can be performed using the systematic tester KTS 670, which is connected to the standardized 16-pin diagnostic connector of the vehicle via adapter cables.

Figure 1. Connecting the KTS 650 to the 16-pin OBD connector

After entering the OBD diagnosis, the diagnostic device displays the following operating functions:

- overview of Onboard diadnosis,
- mode 1, actual values – reading system parameters,
- mode 2, operating conditions,
- mode 3, error memory reading – confirmed error codes,
- mode 4, erasing the error memory of all systems,
- mode 5, lambda probe – test value and expansion of the lambda probe,
- mode 6, the values of the control system prevention test,
- mode 7, reading the memory of sporadic errors - unconfirmed errors,
- mode 8, accumulator (Serbian: executive element, Eng., accumulator),
- mode 9, vehicle information.

AUTODIAGNOSTIC SYSTEM OBD

In the last twenty years, in the automotive industry, there has been a mass application of electronic systems on vehicles in order to reduce:

1. exhaust gas emissions,
2. reduction of fuel consumption,
3. vehicle performance improvements,
4. increasing stability,
5. increasing security
6. to improve comfort.

On the one hand, the increasingly strict legal regulations on reducing the emission of harmful exhaust gases, and on the other hand, the demands of customers related to the characteristics and additional electronic equipment in vehicles, have led to the technical equipment of vehicles that requires professional service personnel.

The main goal of introducing electronic systems to vehicles was related to the requirement to reduce exhaust gas emissions and simplify vehicle repair. The automotive industry called this system "On Board Diagnostic-OBD".

The basic principle of auto-diagnostics is based on the fact that each module in the car (engine, ABS, climatronic, etc.) has a memory in which all errors or malfunctions that occurred during driving are recorded. With the help of the diagnostic program, the data from that memory can be read, so it is very easy to find a failure in that way, without going into a more detailed disassembly or disassembly of the engine.

A computer that connects to the technical system is required for the application of diagnostics. The computer of a system writes error codes in its memory when it notices some illogicality in its operation. The code consists of a letter designation and a number, as well as a very short and concise description in the form of a few words. It directs the user (e.g. a car mechanic) to a fault in a specific part of the system, but it does not mean that it shows which spare part needs to be replaced or where the wiring fault might be.

Diagnostics on the electronically regulated systems of today's cars is impossible without the help of a portable (trip) computer and technical information from the car manufacturer (with knowledge of the principles of system operation). With computers of regulated systems, occasional errors are common. These are errors that are not constant, but sometimes or occasionally appear. If the standard diagnostic procedure is performed while the error is not present, the technical information may lead the service technician to the wrong solution. Therefore, portable diagnostic computers can record the input and output parameters of a system during its operation, and by reviewing the recordings (by comparing the recorded data with those from the technical information), a conclusion and a correct diagnosis can be reached.

In addition to reading the fault memory, diagnostic programs can display all physical quantities during engine operation or driving, such as:

- number of revolutions of the engine crankshaft,
- engine temperature,
- oil pressure,
- volume of intake air,
- turbine pressure,
- current fuel consumption,
- phase shift etc.

In addition to condition monitoring, diagnostic programs can also perform various adaptations such as:

- adjusting the idle gas,
- resetting service intervals,
- switching on and off certain components,
- "flashing" of the instrument panel or engine computer,

• coding of new keys, etc.

In addition to the engine and ABS, with today's cars, it is possible to access:

• automatic transmission,

• climate,

• airbags,

• central lock,

• navigation system (GPS),

• vehicle interior monitoring system,

• vehicle anti-skid system,

• anti-theft system,

• xenon system,

• instrument panel,

• electrical devices, etc.

The auto-diagnosis procedure is shown in the following picture. Without diagnostic devices and programs, today it is difficult, and tomorrow it will be impossible to deal with car maintenance and repairs.

Figure 2. Self-diagnosis procedure

Some newer cars have a dozen computers in them that regulate and monitor the operation of certain devices and systems. When a malfunction occurs, it is necessary to read, find the malfunction, and later cancel the errors that were recorded in the memory of the car's electronic device (ECU), and this cannot be done without an adequate auto-diagnostic instrument. In order for the system to function, a computer is needed along with the diagnostic software. It is most practical to use a desktop computer for this purpose, but it is not necessary.

Figure 3. ECU system

It can be used

and desktop computer at a distance of up to 10 meters from the car. A program for diagnostic compatibility with the diagnostic software should be installed on the computer. Diagnostic software

is a module that enables the connection of a computer and a car that has an OBD II (SAE J1962) diagnostic port (Figure 3) and communicates according to a specific protocol. With the diagnostic program installed, the computer becomes a sophisticated diagnostic device with all the functions of a dedicated device.

Figure 4. Diagnostic port (connection schedule)

OBD systems must perform the following tasks:

-Supervision of all components affecting the exhaust gas system and the functioning of the vehicle drive,

- Detection of deviations and errors,

- Memorization of errors and status information,

-Showing errors.

The objectives of the OBD system are:

-Constant monitoring of all components and systems from the impact on the exhaust gas system,

-Immediate detection and reporting of major errors that would make the show worse,

- Achieving low emission of harmful gases throughout its working life.

The following parameters are monitored:

- Current strength at the ground connection, connection with the positive pole and interruptions,

- Input and output signals from sensors and actuators,

- Signal reliability.